

September 12, 2019



U.S. Department
of Transportation

East Building, PHH-30
1200 New Jersey Avenue S.E.
Washington, D.C. 20590

**Pipeline and Hazardous
Materials Safety Administration**

DOT-SP 20867

EXPIRATION DATE: 2021-03-31

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: Advanced Material Systems Co. (AMS)
Taoyuan City, 33356
Taiwan
2. PURPOSE AND LIMITATIONS:
 - a. This special permit authorizes the manufacture, marking, sale and use of an ISO Standard 11119-2 cylinder, for the transportation in commerce of the material authorized by this special permit. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein.
 - b. The safety analyses performed in development of this special permit only considered the hazards and risks associated with transportation in commerce.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.
4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 172.203(a) and 172.301(c) in that the marking requirements are waived § 173.302(f) in that the cylinder is not authorized for Oxygen.
5. BASIS: This special permit is based on the application of Advanced Material Systems Co. (AMS) dated April 18, 2019, and additional information, August 1, and August 22, 2019, submitted in accordance with § 107.105 and the public proceeding thereon.

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Hazardous Material Description			
Proper Shipping Name	Hazard Class/ Division	Identi- fication Number	Packing Group
Oxygen, compressed	2.2	UN1072	N/A

7. SAFETY CONTROL MEASURES:

- a. PACKAGING: Packaging prescribed is a composite cylinder as described in Advanced Material Systems Co. (AMS) application and additional information submitted on file with the Office of Hazardous Materials Special Permits and Approvals (OHMSPA). The cylinders are exclusively used in aircraft and are a component of Portable Oxygen Cylinder Assemblies (POCA's), used in civil aerospace for emergency applications (first aid and crew mobility in the case of cabin decompression).

The cylinder design must be in accordance with §178.71, UN/ISO Standard 11119-2:2012 (Gas Cylinders of Composite Construction- Specification and Test Methods - Part 2) and must meet all requirements of AMS/Cylinder Service Inc, Report # 1909, dated April 17, 2019 on file with the Office of Hazardous Materials Safety Approvals and Permits Division (OHMSAPD).

- b. MARKING:

(1) Each cylinder must be permanently marked (other than by stamping) in the composite on the sidewall. The marking must be easily visible and must be protected from external damage due to the environment and handling.

(2) The marking must contain the following:

- (i) DOT special permit number (DOT-SP 20867) followed by service pressure expressed in bar (psi).

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(ii) A serial number and the manufacturer's identification number or a symbol as obtained from the Associate Administrator for Hazardous Materials Safety, located just below or immediately following the DOT marking above.

(iii) The DOT inspector's official mark must be placed near the serial number. The marking must contain date the (month and year) of the initial hydraulic proof pressure test for that cylinder.

(iv) The size of the letters and numbers used must be at least 0.64 cm (1/4 inch) high if space permits.

(v) The following are examples of an authorized format for marking:

DOT-SP 20867 128 bar (1,850 psi)
YC0000 M0812
1A18 MM/YY

(vi) Additional markings are permitted in the composite, provided the additional markings do not obscure the required marking and are not detrimental to the integrity of the cylinder.

(vii) Provisions for marking of the required requalification dates and RIN information must be made near the cylinder markings.

c. Requalification: Each cylinder must be requalified once every 5 years by using one of the two methods described in this special permit. The Facility that performs requalification of these composite cylinders must be a RIN holder for requalification of ISO 11119-2 composite cylinders as described in § 180.205(b) or have a valid special permit for requalification of ISO 11119-2 composite cylinders using Modal Acoustic Emission (MAE) testing.

(1) Method 1: Hydraulic Proof Pressure Testing and Visual Inspections must be performed in accordance with the following:

(i) Visual Inspections - The external and internal visual inspection must be in accordance with CGA pamphlet C-6.2.

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(ii) Hydraulic proof pressure test must be performed as described in CGA Pamphlet C.1. The test pressure is equal to 1.5 times the marked working pressure and hold the pressure for a minimum of 3 minutes without a loss of pressure. The testing facility for proof pressure test must be equipped with a protection system (e.g. water jacket well or concrete barrier) to avoid injury during requalification process.

(2) Method 2: Modal Acoustic Emission (MAE) Testing and External Visual Inspection must be in accordance with the following:

(i) MAE must be performed by a holder of a special permit that authorizes performing MAE testing on composite cylinders.

(ii) MAE testing must in accordance with the Modal acoustic emission (MAE) Examination Procedure for Requalification of Composite Overwrapped Pressure Vessels (Cylinders and tubes) posted on PHMSA website, <https://www.phmsa.dot.gov/technical-resources/hazmat-technical-resources/technical-reports> and the additional procedure provided by AMS on file with the Office of Hazardous Materials Safety Approvals and Permits Division (OHMSAPD).

(iii) External visual inspection must be in accordance with CGA pamphlet C-6.2 and with AMS Inspection Manual on file with OHMSAPD.

(3) Requalification Marking: date (month/year) must be permanently marked on the cylinder as specified in paragraph § 180.213. The marking of the RIN symbol on the cylinder certifies compliance with all the terms and conditions of this special permit.

d. OPERATIONAL CONTROLS:

(1) Cylinders manufactured under this special permit are authorized for maximum service use of 15 years from the date of manufacture. The cylinders may be considered for additional 15 years of service life, provided the manufacturer meets all requirements specified under paragraph 8.a. of this special permit.

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(2) Cylinders may not be used for underwater breathing purposes.

(3) Cylinders used in oxygen service must conform with §173.302a(a)(5)(i-iv) and are only authorized aboard aircraft when in accordance with § 175.501.

(4) Cylinders must be packaged in accordance with § 173.301(a)(9).

(5) A cylinder that has been subjected to fire may not be returned to service.

8. SPECIAL PROVISIONS:

a. Service Life Extension Program: Cylinders manufactured under this special permit may be authorized for additional maximum service life of 15 years from the date of manufacture in accordance with the following requirements:

(1) Each cylinder must be requalified by Modal Acoustic Emission (MAE) Testing, Internal and External Visual Inspection as described in paragraph 7.c of this special permit.

(2) Revalidation Plan: AMS must formulate a plan for all the cylinders that are qualified for the additional service life extension. The plan must be submitted to the OHMSAPD within 12 months of the issuance of this special permit and must include:

(i) A detailed procedure for obtaining the UN/ISO 11119-2 cylinders from the field and the applied design qualification testing of each design type;

(A) A procedure for the random selection of a minimum of 5 cylinders which have been in service for 18, 21, 24 and 27 years;

(B) All randomly selected cylinders from the field must be tested in accordance with design qualification testing of UN/ISO 11119-2. Acceptance criteria must be as defined in ISO 11119-2.

(3) The complete MAE test report, including the original test data, must be submitted to the OHMSAPD

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for assessment within 30 days of completion of the test. Failure to meet the acceptance criteria specified in the MAE Examination Procedure shall result in the service life restriction that is a maximum of 15 years from the manufacture date.

b. In accordance with the provisions of Paragraph (b) of §173.22a, persons may use the packaging authorized by this special permit for the transportation of the hazardous materials specified in paragraph 6, only in conformance with the terms of this special permit.

c. A person who is not a holder of this special permit, but receives a package covered by this special permit, may reoffer it for transportation provided no modification or change is made to the package and it is offered for transportation in conformance with this special permit and the HMR.

d. A current copy of this special permit must be maintained at each facility where the package is offered or reoffered for transportation.

e. A current copy of this special permit must be maintained at each facility where the package is manufactured under this special permit and must be made available to a DOT representative upon request.

f. Each packaging manufactured under the authority of this special permit must be either (1) marked with the name of the manufacturer and location (city and state) of the facility at which it is manufactured or (2) marked with a registration symbol designated for a specific manufacturing facility by the Office of Hazardous Materials Special permits and Approvals for a specific manufacturing facility.

g. The cylinders described in this special permit are authorized only for normal transportation as an article of commerce i.e., the movement of hazardous materials packages from consignor to consignee.

h. Transportation of oxygen is only authorized when in accordance with § 172.102(c)(2) Special Provision A52 and §§ 175.85(h) and (i).

9. MODES OF TRANSPORTATION AUTHORIZED: Cargo aircraft and passenger-carrying aircraft (see paragraph 7.d(3) and (4) for restrictions).

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10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each aircraft used to transport packages covered by this special permit. The shipper must furnish a copy of this special permit to the air carrier before or at the time the shipment is tendered.
11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this special permit and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:
 - o All terms and conditions prescribed in this special permit and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
 - o Persons operating under the terms of this special permit must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.
 - o Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this special permit must receive training on the requirements and conditions of this special permit in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this special permit, including display of its number, when this special permit has expired or is otherwise no longer in effect.

Under Title VII of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)—"The Hazardous Materials Safety and Security Reauthorization Act of 2005" (Pub. L. 109-59), 119 Stat. 1144 (August 10, 2005), amended the Federal hazardous materials transportation law by changing the term "exemption" to "special permit" and authorizes a special permit to be granted up to two years for new special permits and up to four years for renewals.

12. REPORTING REQUIREMENTS: Shipments or operations conducted under this special permit are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 - Immediate notice of certain hazardous

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materials incidents, and 171.16 - Detailed hazardous materials incident reports. In addition, the grantee(s) of this special permit must notify the Associate Administrator for Hazardous Materials Safety, in writing, of any incident involving a package, shipment or operation conducted under terms of this special permit.

Issued in Washington, D.C.:



for William Schoonover
Associate Administrator for Hazardous Materials Safety

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, East Building PHH-30, 1200 New Jersey Avenue, Southeast, Washington, D.C. 20590.

Copies of this special permit may be obtained by accessing the Hazardous Materials Safety Homepage at http://hazmat.dot.gov/sp_app/special_permits/spec_perm_index.htm Photo reproductions and legible reductions of this special permit are permitted. Any alteration of this special permit is prohibited.

PO: Mark Toughiry